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10/045,325	10/25/2001	Naomi Goto	MAT-8191US	2446

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EXAMINER	
MILLER, PATRICK L	

ART UNIT	PAPER NUMBER
2837	

DATE MAILED: 06/17/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/045,325	GOTO ET AL.	
	Examiner	Art Unit	
	Patrick Miller	2837	

-- The MAILING DATE of this communication appears on the cover sheet with the correspond nc address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *21 May 2004*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-8 and 10-16* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-8 and 10-16* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *25 October 2001* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

1. Claims 1, 7, and 8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Applicant's disclosed Prior Art (Prior Art Drawings and *Background of Invention*) in view of Toda et al (5,712,540), Ciaccio (5,594,199), and Egawa (JP 10-035245).

   - The Applicant's disclosed Prior Art (Prior Art Drawings and *Background of Invention*) disclose an electric circuit of an electric vehicle (specification page 1, line 24), said circuit comprising: a drive motor (Fig. 25, #62); a drive motor driving device (Fig. 25, #4); an electric compressor for air-conditioning the vehicle (Fig. 25, #23); a compressor driving device (Fig. 25, #5); and a dc power supply (Fig. 25, #1) that is coupled to the input terminals of the drive motor driving device and the compressor driving device (Fig. 25, #1 connected to #4 and #5).
   - The Applicant's disclosed Prior Art does not disclose a smoothing capacitor coupled to the input terminal of the drive motor driving device and shared by both of said driving devices; a radiator shared by both of said driving devices; a case for shielding electromagnetic wave, wherein said driving devices, the smoothing capacitor, and the radiator is disposed in the case; and the compressor-driving device lowers an output of

said compressor-driving device when said drive-motor driving device is above a heavily loaded level.

- Toda et al disclose a capacitor that is coupled to the inputs of two different motor driving devices (Fig. 1, #2e to #4 and #13). The motivation to do such is to reduce voltage spikes and so one converter can supply dc voltage to two inverter circuits. This provides the advantage of reducing overall component size, since only one converter (capacitor) is needed for two motors.
- Ciaccio discloses multiple motor drive circuits mounted on a common radiator (Fig. 2, #66 is radiator and #28 and #57 represent motor driver circuits) and a case that baffles EMI (electromagnetic interference) (fig. 2, case portions #62, #64, and #80 baffle EMI), wherein the motor drivers, radiator, and smoothing capacitor (implied all circuitry is contained in the case) is disposed in the case. Ciaccio's motivation for providing such is to keep the components from overheating (col. 5, lines 9-22) and to reduce the flow of stray radiation toward the circuits from and inside the housing. This provides the advantage of reducing improper circuit operation due to high temperatures and interference (Col. 2, lines 57-65).
- Egawa discloses a system with a blower motor and a compressor motor, wherein the power is reduced to the compressor (compressor driving device) when the drive motor's load is above a specific level (abstract, [0064]-[0083]; load of the drive-motor, i.e. the load of the fan motor in this case, is determined by temperature, airflow, and voltage potential, and when the temperature value causes the airflow and voltage values to exceed a specific level, the power to the compressor is reduced). The motivation to reduce the

output of the compressor when the drive-motor is above a heavily loaded level is to provide the advantage of improving system efficiency ([0084]).

- Therefore, it would have been obvious to one having ordinary skill in the art at the time of the invention to modify the circuit disclosed by the Applicant as Prior Art with the following modifications: One capacitor is shared by two different motor drive circuits, thereby providing the advantage of reducing overall component size, as taught by Toda et al; the motor driving circuits sharing a radiator, and a case that encloses the driving devices, the smoothing capacitor, and the radiator, thereby providing the advantage of reducing improper circuit operation due to heat and interference, as taught by Ciaccio; and lowering the output of the compressor-driving device as described above, thereby providing the advantage of improving system efficiency, as taught by Egawa.
- With respect to claim 7, the Applicant's disclosed Prior Art (Figs. 25 and 26) discloses the compressor-driving device including an inverter circuit (Figs. 25/26 #9), and a power-line from the power supply connected directly (Fig. 25, #1 to bottom of inverter, #9) and via a current detector (Fig. 26, #1 to bottom of #9 via #15).
- With respect to claim 8, the Applicant's disclosed Prior Art (Fig. 26) discloses a compressor-driving device controlling circuit (Fig. 26, #19) and a power supply circuit for converting a dc voltage and supplying said converted voltage to the driving device controlling circuit (Fig. #12 and #16 to #19).

2. Claim 2 is rejected under 35 U.S.C. 103(a) as being unpatentable over Applicant's disclosed Prior Art (Prior Art Drawings and *Background of Invention*), Toda et al, Ciaccio, and Egawa as applied to claim 1 above, and further in view of Betsusou et al (JP 64-031380).
   - Applicant's disclosed Prior Art (Prior Art Drawings and *Background of Invention*), Toda et al, Ciaccio, and Egawa do not disclose the wires extending from the power supply being different lengths.
   - Betsusou et al disclose wires leading from a transformer (represents dc power supply) to an inverter, where the wires differ in length. The motivation to provide such is so the wires will be connected to the correct terminal. This provides the advantage of assuring the life of the device (Abstract).
   - Therefore, it would have been obvious to one having ordinary skill in the art at the time of the invention to modify the circuit of Applicant's disclosed Prior Art (Prior Art Drawings and *Background of Invention*), Toda et al, Ciaccio, and Egawa with wires having different lengths, thereby providing the advantage of assuring power is connected correctly and preventing damage to the device, as taught by Betsusou et al.
3. Claim 3 is rejected under 35 U.S.C. 103(a) as being unpatentable over Applicant's disclosed Prior Art (Prior Art Drawings and *Background of Invention*), Toda et al, Ciaccio, and Egawa as applied to claim 1 above, and further in view of Makaran (5,744,921).
   - Applicant's disclosed Prior Art (Prior Art Drawings and *Background of Invention*), Toda et al, Ciaccio, and Egawa do not disclose the driving device including one of a film capacitor and a ceramic capacitor and coupled between wires extended from the power supply.

- Makaran discloses a control circuit with film capacitors extended from the power supply. The motivation to do such is to provide the advantage of smoothing voltage and reducing EMI emissions (Col. 4, lines 29-38).
- Therefore, it would have been obvious to one having ordinary skill in the art at the time of the invention to modify the circuit of Applicant's disclosed Prior Art (Prior Art Drawings and *Background of Invention*), Toda et al, Ciaccio, and Egawa with a film capacitor extended from the power supply, thereby providing the advantage of smoothing voltage and reducing EMI emissions, as taught by Makaran.

4. Claim 4 is rejected under 35 U.S.C. 103(a) as being unpatentable over Applicant's disclosed Prior Art (Prior Art Drawings and *Background of Invention*), Toda et al, Ciaccio, and Egawa as applied to claim 1 above, and further in view of Wagner (6,207,900).
   - Applicant's disclosed Prior Art (Prior Art Drawings and *Background of Invention*), Toda et al, Ciaccio, and Egawa do not disclose the wires including a shielded-line having a core wire, and an outer wire, where said core and outer wires supply power (claim 4).
   - Wagner discloses a hybrid cable that has a shielded portion (Fig. 1, #4, #10), a core wire (Fig. 1, #1), and an outer wire (Fig. 1, #2). Wagner's motivation for providing a cable as described is to minimize cross-sectional area. This provides the advantage reducing costs by implementing supplemental conductors along with the primary conductors as opposed to using several cables (Col. 1, lines 36-50).
   - Therefore, it would have been obvious to one having ordinary skill in the art at the time of the invention to use a cable as described above to deliver power to the device of the Applicant's disclosed Prior Art (Prior Art Drawings and *Background of Invention*), Toda

et al, Ciaccio, and Egawa thereby providing the advantage of minimizing cross-sectional area, as taught by Wagner.

5. Claim 5 is rejected under 35 U.S.C. 103(a) as being unpatentable over Applicant's disclosed Prior Art (Prior Art Drawings and *Background of Invention*), Toda et al, Ciaccio, and Egawa as applied to claim 1 above, and further in view of Tsukamoto et al (6,476,329).

   - Applicant's disclosed Prior Art (Prior Art Drawings and *Background of Invention*), Toda et al, Ciaccio, and Egawa do not disclose the wires being parallel and held by bendable resin.
   - Tsukamoto et al disclose wires that are made of flexible resin and include a parallel portion (Col. 1, lines 45-46 and Col. 4, line 52). The motivation to provide such is to provide the advantage of improving transmission characteristics (Col. 1, lines 41-43).
   - Therefore, it would have been obvious to one having ordinary skill in the art at the time of the invention to use a wire as described above to deliver power to the device of the Applicant's disclosed Prior Art (Prior Art Drawings and *Background of Invention*), Toda et al, Ciaccio, and Egawa thereby providing the advantage of improving transmission characteristics, as taught by Tsukamoto

6. Claim 6 is rejected under 35 U.S.C. 103(a) as being unpatentable over Applicant's disclosed Prior Art (Prior Art Drawings and *Background of Invention*), Toda et al, Ciaccio, and Egawa as applied to claim 1 above, and further in view of Pieronek et al (5,452,201).

   - Applicant's disclosed Prior Art (Prior Art Drawings and *Background of Invention*), Toda et al, Ciaccio, and Egawa do not disclose the wires being twisted-paired.

- Pieronek et al disclose wires that are twisted-pair that deliver power to a motor controller (Fig. 1, power through #18 to #12). The motivation to provide twisted-pair power wires is to provide the advantage of protecting against reverse polarity and high voltage spikes (Col. 5, lines 58-66 and Col. 10, lines 18-24).
- Therefore, it would have been obvious to one having ordinary skill in the art at the time of the invention to use a twisted-pair wire as described above to deliver power to the device of the Applicant's disclosed Prior Art (Prior Art Drawings and *Background of Invention*), Toda et al, Ciaccio, and Egawa, thereby providing the advantage of protecting against reverse polarity and high voltage spikes, as taught by Pieronek et al.

7. Claim 10 and is rejected under 35 U.S.C. 103(a) as being unpatentable over Applicant's disclosed Prior Art (Prior Art Drawings and *Background of Invention*), Toda et al, Ciaccio, and Egawa, Wagner as applied to claims 1 and 4 above, and further in view of Betsusou et al (JP 64-031380).
   - Applicant's disclosed Prior Art (Prior Art Drawings and *Background of Invention*), Toda et al, Ciaccio, Egawa, and Wagner do not disclose the wires extending from the power supply being different lengths.
   - Betsusou et al disclose wires leading from a transformer (represents dc power supply) to an inverter, where the wires differ in length. The motivation to provide such is so the wires will be connected to the correct terminal. This provides the advantage of assuring the life of the device (Abstract).
   - Therefore, it would have been obvious to one having ordinary skill in the art at the time of the invention to modify the circuit of Applicant's disclosed Prior Art (Prior Art

Drawings and *Background of Invention*), Toda et al, Ciaccio, Egawa, and Wagner with wires having different lengths, thereby providing the advantage of assuring power is connected correctly and preventing damage to the device, as taught by Betsusou et al.

8. Claim 11 and is rejected under 35 U.S.C. 103(a) as being unpatentable over Applicant's disclosed Prior Art (Prior Art Drawings and *Background of Invention*), Toda et al, Ciaccio, Egawa and Tsukamoto et al as applied to claims 1 and 5 above, and further in view of Betsusou et al (JP 64-031380).

- Applicant's disclosed Prior Art (Prior Art Drawings and *Background of Invention*), Toda et al, Ciaccio, Egawa, and Tsukamoto et al do not disclose the wires extending from the power supply being different lengths.
- Betsusou et al disclose wires leading from a transformer (represents dc power supply) to an inverter, where the wires differ in length. The motivation to provide such is so the wires will be connected to the correct terminal. This provides the advantage of assuring the life of the device (Abstract).
- Therefore, it would have been obvious to one having ordinary skill in the art at the time of the invention to modify the circuit of Applicant's disclosed Prior Art (Prior Art Drawings and *Background of Invention*), Toda et al, Ciaccio, Egawa and Tsukamoto et al with wires having different lengths, thereby providing the advantage of assuring power is connected correctly and preventing damage to the device, as taught by Betsusou et al.

9. Claim 12 is rejected under 35 U.S.C. 103(a) as being unpatentable over Applicant's disclosed Prior Art (Prior Art Drawings and *Background of Invention*), Toda et al, Ciaccio, and Egawa as applied to claims 1 and 8 above, and further in view of Goto et al (5,714,806).

- Applicant's disclosed Prior Art (Prior Art Drawings and *Background of Invention*), Toda et al, Ciaccio, and Egawa do not disclose a diode and switch disposed in parallel and connected to the power and compressor driving device.
- Goto et al disclose a diode and switch disposed in parallel and connected to the power and compressor-driving device (Fig. 1, #28 and #16 are parallel and connected to #14 and #12). The motivation to provide such is to run the compressor from the battery when the switch is closed and charge the capacitor when the switch is open. This provides the advantage of charging the capacitor and not letting reverse-current damage the battery (Col. 3, lines 42-67).
- Therefore, it would have been obvious to one having ordinary skill in the art at the time of the invention to modify the circuit of Applicant's disclosed Prior Art (Prior Art Drawings and *Background of Invention*), Toda et al, Ciaccio, and Egawa, as disclosed above, thereby providing the advantage of preventing damage to the battery, as taught by Goto et al.

10. Claim 13 is rejected under 35 U.S.C. 103(a) as being unpatentable over Applicant's disclosed Prior Art (Prior Art Drawings and *Background of Invention*) in view of Toda et al (5,712,540), Ciaccio (5,594,199), Makaran (5,744,921), and Egawa (JP 10-035245).

- The Applicant's disclosed Prior Art (Prior Art Drawings and *Background of Invention*) disclose an electric circuit of an electric vehicle (specification page 1, line 24), said

circuit comprising: a drive motor (Fig. 25, #62), a drive motor driving device (Fig. 25, #4); an electric compressor for air-conditioning the vehicle (Fig. 25, #23), a compressor driving device (Fig. 25, #5), and a dc power supply (Fig. 25, #1) that is coupled to the input terminals of the drive motor driving device and the compressor driving device (Fig. 25, #1 connected to #4 and #5).

- The Applicant's disclosed Prior Art does not disclose a smoothing capacitor coupled to the input terminal of the drive motor driving device and shared by both of said driving devices, a radiator shared by both of said driving devices, the driving device including one of a film capacitor and a ceramic capacitor and coupled between wires extended from the power supply; a case for shielding electromagnetic wave, wherein said driving devices and the smoothing capacitor are disposed in the case; and the compressor-driving device lowers an output of said compressor-driving device when said drive-motor driving device is above a heavily loaded level..
- Toda et al disclose a capacitor that is coupled to the inputs of two different motor driving devices (Fig. 1, #2e to #4 and #13). The motivation to do such is to reduce voltage spikes and so one converter can supply dc voltage to two inverter circuits. This provides the advantage of reducing overall component size, since only one converter (capacitor) is needed for two motors.
- Makaran discloses a control circuit with film capacitors extended from the power supply. The motivation to do such is to provide the advantage of smoothing voltage and reducing EMI emissions (Col. 4, lines 29-38).

- Ciaccio discloses multiple motor drive circuits mounted on a common radiator (Fig. 2, #66 is radiator and #28 and #57 represent motor driver circuits) and a case that baffles EMI (electromagnetic interference) (fig. 2, case portions #62, #64, and #80 baffle EMI), wherein the driving devices and the smoothing capacitor are disposed in the case (implied all circuitry is contained in the case). Ciaccio's motivation for providing such is to keep the components from overheating (col. 5, lines 9-22) and to reduce the flow of stray radiation toward the circuits in the housing. This provides the advantage of reducing improper circuit operation due to high temperatures and interference (Col. 2, lines 57-65).
- Egawa discloses a system with a blower motor and a compressor motor, wherein the power is reduced to the compressor (compressor driving device) when the drive motor's load is above a specific level (abstract, [0064]-[0083]; load of the drive-motor, i.e. the load of the fan motor in this case, is determined by temperature, airflow, and voltage potential, and when the temperature value causes the airflow and voltage values to exceed a specific level, the power to the compressor is reduced). The motivation to reduce the output of the compressor when the drive-motor is above a heavily loaded level is to provide the advantage of improving system efficiency ([0084]).
- Therefore, it would have been obvious to one having ordinary skill in the art at the time of the invention to modify the circuit disclosed by the Applicant as Prior Art with the following modifications: One capacitor is shared by two different motor drive circuits, thereby providing the advantage of reducing overall component size, as taught by Toda et al; the control circuit has a film capacitor extended from the power supply, which providing the advantage of smoothing voltage and reducing EMI emissions, as taught by

Makaran; the motor driving circuits share a radiator, and a case that encloses the driving devices and the smoothing capacitor, thereby providing the advantage of reducing improper circuit operation due to heat and interference, as taught by Ciaccio; and lowering the output of the compressor-driving device as described above, thereby providing the advantage of improving system efficiency, as taught by Egawa.

11. Claim 14 is rejected under 35 U.S.C. 103(a) as being unpatentable over Applicant's disclosed Prior Art (Prior Art Drawings and *Background of Invention*) in view of Toda et al (5,712,540), Ciaccio (5,594,199), Makaran (5,744,921), Tsukamoto et al (6,476,329), and Egawa (JP 10-035245).

- The Applicant's disclosed Prior Art (Prior Art Drawings and *Background of Invention*) disclose an electric circuit of an electric vehicle (specification page 1, line 24), said circuit comprising: a drive motor (Fig. 25, #62), a drive motor driving device (Fig. 25, #4); an electric compressor for air-conditioning the vehicle (Fig. 25, #23), a compressor driving device (Fig. 25, #5), and a dc power supply (Fig. 25, #1) that is coupled to the input terminals of the drive motor driving device and the compressor driving device (Fig. 25, #1 connected to #4 and #5).
- The Applicant's disclosed Prior Art does not disclose a smoothing capacitor coupled to the input terminal of the drive motor driving device and shared by both of said driving devices, a radiator shared by both of said driving devices, the driving device including one of a film capacitor and a ceramic capacitor and coupled between wires extended from the power supply; a case for shielding electromagnetic wave, wherein said driving devices and the smoothing capacitor are disposed in the case; the wires being parallel and

held by bendable resin; and the compressor-driving device lowers an output of said compressor-driving device when said drive-motor driving device is above a heavily loaded level.

- Toda et al disclose a capacitor that is coupled to the inputs of two different motor driving devices (Fig. 1, #2e to #4 and #13). The motivation to do such is to reduce voltage spikes and so one converter can supply dc voltage to two inverter circuits. This provides the advantage of reducing overall component size, since only one converter (capacitor) is needed for two motors.
- Makaran discloses a control circuit with film capacitors extended from the power supply. The motivation to do such is to provide the advantage of smoothing voltage and reducing EMI emissions (Col. 4, lines 29-38).
- Ciaccio discloses multiple motor drive circuits mounted on a common radiator (Fig. 2, #66 is radiator and #28 and #57 represent motor driver circuits) and a case that baffles EMI (electromagnetic interference) (fig. 2, case portions #62, #64, and #80 baffle EMI), wherein the driving devices and the smoothing capacitor are disposed in the case (implied all circuitry is contained in the case). Ciaccio's motivation for providing such is to keep the components from overheating (col. 5, lines 9-22) and to reduce the flow of stray radiation toward the circuits in the housing. This provides the advantage of reducing improper circuit operation due to high temperatures and interferences (Col. 2, lines 57-65).

- Tsukamoto et al disclose wires that are made of flexible resin and include a parallel portion (Col. 1, lines 45-46 and Col. 4, line 52). The motivation to provide such is to provide the advantage of improving transmission characteristics (Col. 1, lines 41-43).
- Egawa discloses a system with a blower motor and a compressor motor, wherein the power is reduced to the compressor (compressor driving device) when the drive motor's load is above a specific level (abstract, [0064]-[0083]; load of the drive-motor, i.e. the load of the fan motor in this case, is determined by temperature, airflow, and voltage potential, and when the temperature value causes the airflow and voltage values to exceed a specific level, the power to the compressor is reduced). The motivation to reduce the output of the compressor when the drive-motor is above a heavily loaded level is to provide the advantage of improving system efficiency ([0084]).
- Therefore, it would have been obvious to one having ordinary skill in the art at the time of the invention to modify the circuit disclosed by the Applicant as Prior Art with the following modifications: One capacitor is shared by two different motor drive circuits, thereby providing the advantage of reducing overall component size, as taught by Toda et al; the control circuit has a film capacitor extended from the power supply, which providing the advantage of smoothing voltage and reducing EMI emissions, as taught by Makaran; the motor driving circuits share a radiator, and a case that encloses the driving devices and the smoothing capacitor, thereby providing the advantage of reducing improper circuit operation due to heat and interference, as taught by Ciaccio; the wires are made of flexible resin and include a parallel portion, which provides the advantage of improving transmission characteristics, as taught by Tsukamoto et al; and lowering the

output of the compressor-driving device as described above, thereby providing the advantage of improving system efficiency, as taught by Egawa.

12. Claim 15 is rejected under 35 U.S.C. 103(a) as being unpatentable over Applicant's disclosed Prior Art (Prior Art Drawings and *Background of Invention*) in view of Toda et al (5,712,540), Ciaccio (5,594,199), Makaran (5,744,921), Pieronek et al (5,452,201), and Egawa (JP 10-035245).

- The Applicant's disclosed Prior Art (Prior Art Drawings and *Background of Invention*) disclose an electric circuit of an electric vehicle (specification page 1, line 24), said circuit comprising: a drive motor (Fig. 25, #62), a drive motor driving device (Fig. 25, #4), an electric compressor for air-conditioning the vehicle (Fig. 25, #23), a compressor driving device (Fig. 25, #5), and a dc power supply (Fig. 25, #1) that is coupled to the input terminals of the drive motor driving device and the compressor driving device (Fig. 25, #1 connected to #4 and #5).
- The Applicant's disclosed Prior Art does not disclose a smoothing capacitor coupled to the input terminal of the drive motor driving device and shared by both of said driving devices, a radiator shared by both of said driving devices, the driving device including one of a film capacitor and a ceramic capacitor and coupled between wires extended from the power supply; a case for shielding electromagnetic wave, wherein said driving devices and the smoothing capacitor are disposed in the case; and the compressor-driving device lowers an output of said compressor-driving device when said drive-motor driving device is above a heavily loaded level..

- Toda et al disclose a capacitor that is coupled to the inputs of two different motor driving devices (Fig. 1, #2e to #4 and #13). The motivation to do such is to reduce voltage spikes and so one converter can supply dc voltage to two inverter circuits. This provides the advantage of reducing overall component size, since only one converter (capacitor) is needed for two motors.
- Makaran discloses a control circuit with film capacitors extended from the power supply. The motivation to do such is to provide the advantage of smoothing voltage and reducing EMI emissions (Col. 4, lines 29-38).
- Ciaccio discloses multiple motor drive circuits mounted on a common radiator (Fig. 2, #66 is radiator and #28 and #57 represent motor driver circuits) and a case that baffles EMI (electromagnetic interference) (fig. 2, case portions #62, #64, and #80 baffle EMI), wherein the driving devices and the smoothing capacitor are disposed in the case (implied all circuitry is contained in the case). Ciaccio's motivation for providing such is to keep the components from overheating (col. 5, lines 9-22) and to reduce the flow of stray radiation toward the circuits in the housing. This provides the advantage of reducing improper circuit operation due to high temperatures and interferences (Col. 2, lines 57-65).
- Pieronek et al disclose wires that are twisted-pair that deliver power to a motor controller (Fig. 1, power through #18 to #12). The motivation to provide twisted-pair power wires is to provide the advantage of protecting against reverse polarity and high voltage spikes (Col. 5, lines 58-66 and Col. 10, lines 18-24).

- Egawa discloses a system with a blower motor and a compressor motor, wherein the power is reduced to the compressor (compressor driving device) when the drive motor's load is above a specific level (abstract, [0064]-[0083]; load of the drive-motor, i.e. the load of the fan motor in this case, is determined by temperature, airflow, and voltage potential, and when the temperature value causes the airflow and voltage values to exceed a specific level, the power to the compressor is reduced). The motivation to reduce the output of the compressor when the drive-motor is above a heavily loaded level is to provide the advantage of improving system efficiency ([0084]).
- Therefore, it would have been obvious to one having ordinary skill in the art at the time of the invention to modify the circuit disclosed by the Applicant as Prior Art with the following modifications: One capacitor is shared by two different motor drive circuits, thereby providing the advantage of reducing overall component size, as taught by Toda et al; the control circuit has a film capacitor extended from the power supply, which providing the advantage of smoothing voltage and reducing EMI emissions, as taught by Makaran; the motor driving circuits share a radiator, and a case that encloses the driving devices and the smoothing capacitor, thereby providing the advantage of reducing improper circuit operation due to heat and interference, as taught by Ciaccio; the wires are twisted-pair wires, which provide the advantage of protecting against reverse polarity and high-voltage spikes, as taught by Pieronek et al; and lowering the output of the compressor-driving device as described above, thereby providing the advantage of improving system efficiency, as taught by Egawa.

13. Claim 16 is rejected under 35 U.S.C. 103(a) as being unpatentable over Applicant's disclosed Prior Art (Prior Art Drawings and *Background of Invention*) in view of Toda et al (5,712,540), Ciaccio (5,594,199), and Egawa (JP 10-035245).

- The Applicant's disclosed Prior Art (Prior Art Drawings and *Background of Invention*) disclose an electric circuit of an electric vehicle (specification page 1, line 24), said circuit comprising: a drive motor (Fig. 25, #62), a drive motor driving device (Fig. 25, #4), an electric compressor for air-conditioning the vehicle (Fig. 25, #23), a compressor driving device (Fig. 25, #5), and a dc power supply (Fig. 25, #1) that is coupled to the input terminals of the drive motor driving device and the compressor driving device (Fig. 25, #1 connected to #4 and #5), and the compressor driving device includes: a circuit for controlling the driving device; and a power supply circuit for converting voltage from the dc source, and the driving device controlling circuit uses the exclusive control power supply (fig. 26, #12).
- The Applicant's disclosed Prior Art does not disclose a smoothing capacitor coupled to the input terminal of the drive motor driving device and shared by both of said driving devices; a radiator shared by both of said driving devices; a case for shielding electromagnetic wave, wherein said driving devices and the smoothing capacitor are disposed in the case; and the compressor-driving device lowers an output of said compressor-driving device when said drive-motor driving device is above a heavily loaded level..
- Toda et al disclose a capacitor that is coupled to the inputs of two different motor driving devices (Fig. 1, #2e to #4 and #13). The motivation to do such is to reduce voltage spikes

and so one converter can supply dc voltage to two inverter circuits. This provides the advantage of reducing overall component size, since only one converter (capacitor) is needed for two motors.

- Ciaccio discloses multiple motor drive circuits mounted on a common radiator (Fig. 2, #66 is radiator and #28 and #57 represent motor driver circuits) and a case that baffles EMI (electromagnetic interference) (fig. 2, case portions #62, #64, and #80 baffle EMI), wherein the driving devices and the smoothing capacitor are disposed in the case (implied all circuitry is contained in the case). Ciaccio's motivation for providing such is to keep the components from overheating (col. 5, lines 9-22) and to reduce the flow of stray radiation toward the circuits in the housing. This provides the advantage of reducing improper circuit operation due to high temperatures and interferences (Col. 2, lines 57-65).
- Egawa discloses a system with a blower motor and a compressor motor, wherein the power is reduced to the compressor (compressor driving device) when the drive motor's load is above a specific level (abstract, [0064]-[0083]; load of the drive-motor, i.e. the load of the fan motor in this case, is determined by temperature, airflow, and voltage potential, and when the temperature value causes the airflow and voltage values to exceed a specific level, the power to the compressor is reduced). The motivation to reduce the output of the compressor when the drive-motor is above a heavily loaded level is to provide the advantage of improving system efficiency ([0084]).
- Therefore, it would have been obvious to one having ordinary skill in the art at the time of the invention to modify the circuit disclosed by the Applicant as Prior Art with the

following modifications: One capacitor is shared by two different motor drive circuits, thereby providing the advantage of reducing overall component size, as taught by Toda et al; the motor driving circuits sharing a radiator, and a case that encloses the driving devices and the smoothing capacitor, thereby providing the advantage of reducing improper circuit operation due to heat and interference, as taught by Ciaccio; and lowering the output of the compressor-driving device as described above, thereby providing the advantage of improving system efficiency, as taught by Egawa.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Patrick Miller whose telephone number is 571-272-2070. The examiner can normally be reached on M-F, 8:30-5:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David Martin can be reached on 571-272-2800 ext 41. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9318.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-306-3431.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Patrick Miller
Examiner
Art Unit 2837

pm
June 10, 2004

Bentsu Ro
Primary Examiner